Evaluation and Program Planning 73 (2019) 214–223

Contents lists available at ScienceDirect

Evaluation and Program Planning

journal homepage: www.elsevier.com/locate/evalprogplan

Adoption for adaptation: A theory-based approach for monitoring a complex policy initiative

Jesse McConnell

178 NE Basswood Circle, Lees Summit, MO 64064, USA

ARTICLE INFO

Keywords:
Complexity
Systemic change
Policy initiative
Adoption
Adaptation
Programme monitoring
Theory-based approach
Evaluative indicators
Categorical indicators

ABSTRACT

This paper explores some of the challenges involved in designing a monitoring framework for a complex policy initiative designed to support climate change adaptation in a highly varied and dynamic implementation environment. It looks specifically at the UK's Department for International Development (DFID) initiative called Action on Climate Today, a five-year programme that aims to support the mainstreaming of climate change adaptation into policy systems in five countries and ten locations in South Asia.

This paper presents a theory-based approach to designing a monitoring system for the ACT programme that seeks to account for the programme's design and implementation complexities. It does so by providing an example for monitoring the causal processes and mechanisms that underpin the programme's theory of change. The paper highlights a systematic approach to context monitoring through periodic context assessments and evaluative indicators; the use of categorical indicators to capture a diverse portfolio of support; and a flexible results framework structured around the adoption and implementation of programme outputs into the targeted policy systems.

1. Introduction

The UK's Department for International Development (DFID) is funding a five-year programme on climate change adaptation called Action on Climate Today (ACT)[1], being implemented across five countries and ten locations in South Asia.[2] The programme aims to support the mainstreaming of climate change into policies and governance systems for adaptation to the impacts of climate change. It does so by providing technical assistance to national and sub-national governments to develop strategies, policies, and systems that are adapted to the impacts of climate change. Support is provided in the areas of climate resilience, particularly in the water management and agriculture sectors, promoting investments for climate compatible development, building knowledge, and attracting further climate change investment from public and private sectors.[3]

The programme can be described as a *complex policy initiative*, an approach to creating lasting change increasingly valued for its sensitivity to the systemic nature of the major challenges facing the human condition, such as poverty, conflict, and a changing climate. But the complex nature of designing and implementing an intervention aimed at systemic change requires an approach to monitoring that can provide the flexibility needed for the intervention to operate and function to achieve its objective, while ensuring that its results are accurately captured to enable an understanding of its effect and the adaptation of its delivery approach as needed.

Theory-based approaches to monitoring and evaluation have developed over recent decades to provide solutions for understanding the effects of complex programmes. Drawing from the literature on theory-based approaches to evaluation, this paper aims to contribute to the body of literature around theory-based monitoring for complex policy interventions, providing a case study of its application in such a programme.

This paper hinges on two major theory components: complex policy programme theory, developed in Section 2, followed by theory-based approaches to monitoring and evaluation, described in Section 3. These two components are then applied to the ACT programme in Section 4, demonstrating specifically how theory-based approaches were used to develop ACT's monitoring system. Examples include systematic context

E-mail address: mcconnell.jesse@gmail.com.

[1] Originally titled Climate Proofing Growth and Development (CPGD), the programme was renamed as it incorporated an India-specific programme titled Climate Change Innovation Programme (CCIP).

[2] The programme is implemented nationally in Afghanistan, Bangladesh, Nepal and Pakistan, and sub-nationally in India in Assam, Bihar, Chhattisgarh, Kerala, Odisha, and Maharashtra.

[3] For more programme information, please visit ACT on www.actiononclimate.today

https://doi.org/10.1016/j.evalprogplan.2019.01.008
Received 21 August 2018; Received in revised form 22 January 2019; Accepted 23 January 2019
Available online 25 January 2019
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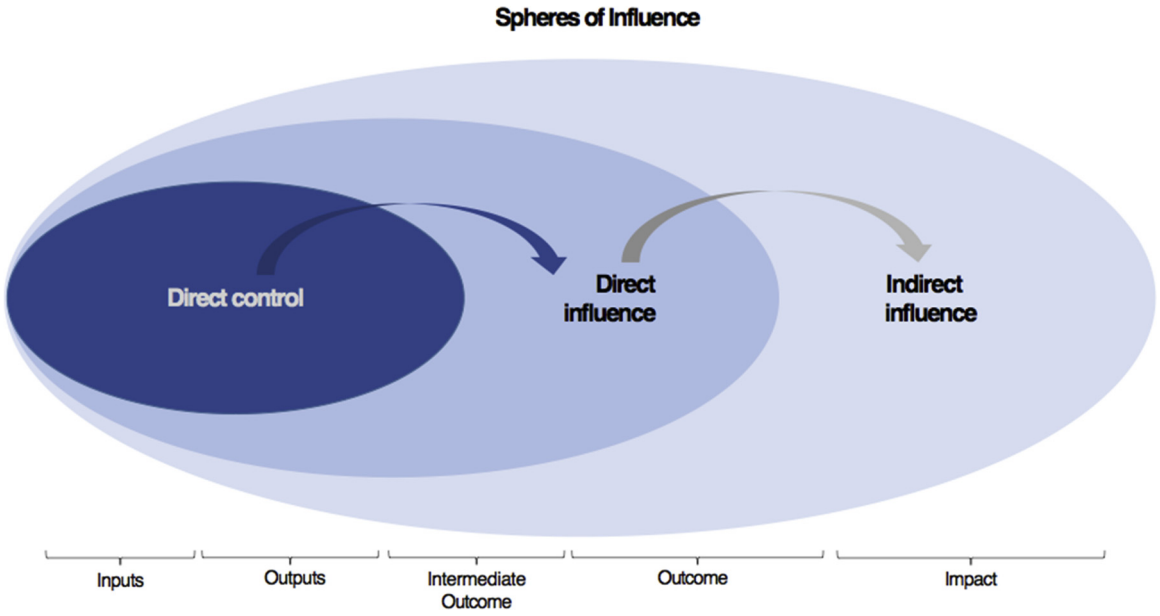

Fig. 1. Programme 'Spheres of Influence'.
Source: adapted from Montague et al. (2003)

monitoring through 'evaluative indicators', the use of 'categorical indicators' to capture diverse and varied outputs across multiple sectors and implementation locations, and a flexible results framework structure that mirrors the theory of change's causal processes of output adoption (intermediate outcomes) and subsequent implementation (outcomes) as a basis for inferring the programme's effect. Section 5 presents lessons learned from some of the challenges and successes of the monitoring system, and potential considerations for those in contexts where a similar theory-based approach may provide a viable design option for programme monitoring.

2. Complex policy programme theory

2.1. Systemic problems and solutions

Complex policy initiatives have become a norm for interventions intent on social change (Forss & Schwartz, 2011; Marra, 2011). Complex policy initiatives have been used to target 'big social problems' that challenge contemporary human existence, such as eliminating endemic poverty, building state stability, ending protracted conflicts, or adapting to the effects of climate change. The reason policy initiatives have become a standard approach to addressing large and complex challenges is the recognition that the majority of these 'big problems' are constituted by institutions and complex systems of intermediary agents, such as organisations, governments, and institutions, which govern behaviour and the way that societies interact (Acemoglu & Robinson, 2012; Andrews, 2013; Booth, 2014; Harari, 2015; North, 1990; World Bank, 2017).

Interventions designed to address these challenges tend to be framed on the idea that big problems are *systemic*, rather than isolated or localised, and that by affecting systemic change, impact at specific or local levels is enhanced, achieving impact at a larger scale and with greater sustainability (Strohr, 2015; Thomas, 1979; Williams & Hummelbrunner, 2011). Systems can be defined as an 'interconnected set of elements that is coherently organised in a way that achieves something' (in Strohr, 2015: 16). Such systems include structural policies which 'embody and articulate different knowledge sets, are made of the connections and interactions amongst agents and evolve over time' (Marra, 2011, p. 98).

2.2. Direct and indirect impact

Policy initiatives designed to address systemic policy changes also tend to entail large programmes that include multiple projects or interventions that aim to address specific aspects of a larger problem for multiple population groups or locations (Forss & Schwartz, 2011). This logic postulates that if the structural policies of a particular system can be changed to a desired end, the system itself can be changed, which will ultimately have a much more significant impact on the population within the system's aegis than a limited term and externally resourced intervention might hope for. In this way, a policy intervention can be described as having *indirect impact*, whereby the intervention provides support to a mediator, or an intermediary agent, whether an individual, organisation, or group, which has the ability to affect change within a system, and thereby positively change the condition of the people living within that system (Bamberger, Rugh, & Mabry, 2012; Kaufman, 2006; Marra, 2011; World Bank, 2017). This involves a process of change that is not only channelled through an intermediary, but also involves a significantly less linear causal process towards change than a more conventional *direct impact* intervention may entail (Marra, 2011; Mayne, 2012).

2.3. Leveraging influence

Because of the indirect nature of a policy intervention's approach to creating systemic change by providing support or advice to intermediaries (agents, organisations, governments) that have power or authority to create a particular change within the system (Andrews, McConnell, & Wescott, 2010), the intervention operates on an inherent premise of its ability to influence both the intermediaries and the wider system to take up its supported changes (Jones, 2011; Montague, Porteous, & Sridharan, 2011). This premise – that influence plays a fundamental role in effective policy interventions' ability to achieve their intended change – is often overlooked as a core design characteristic (Barnett & Gregorowski, 2013; Jones, 2011). But by framing a policy intervention more explicitly around an indirect impact approach, this provides a clearer foundation from which to develop the intervention's theory of change along a process of influencing the intermediary agent directly and the wider system indirectly.

Montague, Young, and Montague, (2003) describe an intervention's

reach and the levels of influence it may have as 'spheres of influence' (Fig. 1), beginning with its sphere of direct control, in which it is able to provide inputs and produce outputs, followed by direct and indirect influence, in which it has varying levels of influence on the intermediaries that it supports. Inputs and outputs are placed squarely within a programme's sphere of control (Bamberger et al., 2012), whereas outcomes and impact – the programme's effects (OECD, 2002) – are both found within its influence, to differing degrees. The intermediate outcome provides a bridge to trace an intervention's progression from its direct control (outputs) into its spheres of influence (outcomes and impact).

The value in highlighting the influencing dimensions of a policy initiative or technical support more generally is that by incorporating this into the structure of its design elements (theory of change, results framework, etc), it assists an intervention in more effectively and holistically monitoring its effectiveness in achieving results. When these aspects of the change process, underpinned by levels of influence, are omitted from a complex intervention's monitoring system, the process of determining the intervention's effects become significantly more challenging, costly and onerous.

2.4. ACT's complexity characteristics

The ACT programme is a complex policy initiative. It encompasses a number of characteristics associated with complexity, which present challenges to the way in which it is monitored. As a 'policy initiative', ACT's intention is to influence shifts in the broader governance systems of climate change adaptation in South Asia by supporting the people working within those systems to develop their knowledge and capacity, influence their mandates and incentives, and help shape the mechanisms and procedures that underpin climate change governance in the region (Shakya, Cooke, Gupta, & Greene, 2018).

ACT's complexity characteristics begin with the *nonlinear* nature of the arena in which it aims to provide its support and produce specific change (see Patton, 2011, p. 124; Booth & Unsworth, 2014; Booth, 2014). The role that the programme's influence plays in encouraging its outputs along a causal process of adoption into the policy architecture that it supports adds a further dimension to the programme's nonlinearity. ACT's experience has shown that a differentiated approach to influencing is necessary in order to be effective. For example, the decentralised context in Assam's sub-national government in India, where ACT provides support, requires engagement with a broader group of stakeholders than in the more centralised administrative system in Afghanistan (Gogoi, Bahadur, & Rumbaitis del Rio, 2017).

Emergence is complexity characteristic that alerts one to the notion that specific outcomes may not necessarily be known in advance and thus plans to measure or evaluate them may not be determined in advance either (Patton, 2011). The effects of a changing climate are, in many ways, unknown, evolving, and still emerging, and will likely continue to do so for a long time to come (Bourse, McGinn, & Pringle, 2014; Fisher, Dinshaw, McGray, Rai, & Schaar, 2015; World Bank, 2010). The sectoral entry points that ACT has used across its ten implementation locations has demonstrated this point (Tanner, Zaman, & Acharya, 2018). In Kerala, ACT supported the Department of Health Services to prepare a climate-health vulnerability and adaptation plan to prepare treatment strategies for climate-related health disorders, while in Maharashtra ACT was asked to provide evidence-based advice on measures for managing water scarcity in line with expected changes in rainfall (Gogoi et al., 2017).

A further important characteristic of complexity that features strongly in ACT is the *coevolutionary* nature of the programme's support and its process of change (see Garnsey & McGlade, 2006, p. 3–4). The programme was carefully designed around specific methods for identifying problems through iterative and consultative processes before any solutions were developed (Andrews, Pritchett, & Woolcock, 2012), which emerged through its use of a 'long-range planning exercise' (LRPE) undertaken in each location (elaborated on in section 4.4). In this way, ACT has sought to be problem-focused rather than solution-driven, where problems are locally identified and defined, embedding this coevolutionary nature into the fabric of its regular implementation processes (Andrews, Pritchett, & Woolcock, 2015; Gogoi, 2017).

Perhaps the most important complexity characteristic is the *systemic* nature of the environment in which ACT provides its support and aims to achieve its results (see Forss & Schwartz, 2011; Williams & Hummelbrunner, 2011). For ACT, this is the core element of its design and approach: providing support for climate change adaptation in ten locations where support is tailored to each, with each having unique climate change challenges, governance architecture, policy frameworks, political dynamics, and technical capacity to influence and adapt these governance systems. In this way, acknowledging complexity acknowledges multiple relational dimensions of change in environments that are highly dynamic, where the cause-and-effect relationships are not obvious nor linear, and the approaches to influencing change are highly varied (Tanner et al., 2018).

3. Theory-based approaches to monitoring and evaluation

Theory-based approaches to monitoring and evaluation have gained prominence in recent years largely out of an increased sensitivity to complexity and an acknowledged need for more systemic change to underpin development efforts (Scriven, 2008; Stame, 2004; Weiss, 1997).

3.1. Theory-based evaluation

Part of the impetus to this increased prominence of theory-based solutions is the challenge of determining attribution and causality in complex situations (Mayne, 2011; Scriven, 2008; Stame, 2004). Juxtaposed to methods-based approaches to evaluation, where the precise application of rigorous methods ensure an evaluation's credibility, theory-based approaches to evaluation emerged in the acknowledgement that programmes inherently have theories about how change happens, and that those theories should provide the guideposts to determining an intervention's effects rather than an externally imposed methodology (Forss & Schwartz, 2011; Peersman et al., 2016; Rogers, 2011). The centrality of a programme's theory – articulated in its theory of change (ToC) – allows for important assumptions to be made explicit about why the inputs and outputs it delivers are believed to change a problem towards a desired result and be monitored or evaluated (Taplin, Clark, Collins, & Colby, 2013; Vogel, 2012).

A number of different theory-based approaches have been developed for determining worth or the causality in an intervention's impact, using an intervention's ToC to infer causation (Weiss, 1995; Davidson, 2009; Mayne, 2012; White & Phillips, 2012), whereby the theory of change 'sets out the mechanisms and context…that will produce the outcome sought' (Mayne, 2011, p. 61). Most approaches tend to trace the causal processes articulated in a ToC (Weiss, 1995; Mayne, 2012). Often referred to as 'process tracing', this approach 'is well-suited to studying decision-making processes and can capture emergent processes because it traces events over time, and it permits the study of complex causal relationships and provides a strong basis for inferring cause' (Thusi & Lucas, 2013, p. 3). Weiss (1997, p. 70) argues that if it is possible to demonstrate the steps involved in an intervention's progression from inputs to outcomes, then causal attribution is within reach. Morris (2005), p. 15) puts forward this idea of 'process theory' to infer causality, arguing that 'process theory can often handle the problem of causal inference better than variance theory in the "high-contingency" conditions of the social sciences'.

Other approaches tend to more tentatively trace an intervention's process of implementation towards claiming a *contribution* to particular results, rather than necessarily seeking to claim *attribution* for results in their entirety (Mayne, 2012). The incorporation of strong contextual

understanding can then further strengthen the view towards other possible influencing factors on an intervention's effects (Pawson, 2001). Nevertheless, the evaluative objective of such approaches should be to reduce uncertainty about an intervention's contribution to a particular change.

3.2. Theory-based monitoring

As with theory-based evaluation, much of the literature on theory-based monitoring derives from the premise of 'understanding the *mechanisms* by which programmes produce their effects' (Davidson, 2000: p. 18, emphasis added). These mechanisms constitute the causal chains within programme theories about how certain inputs are assumed to address specific problems and lead to a desired result. *Evaluating* the effectiveness of those mechanisms consists of a measurement, through the rigorous accumulation and analysis of evidence, of how effectively an intervention's causal mechanisms hold true during its implementation (OECD, 2002). Theory-based *monitoring* relates to the on-going and systematic collection of data (OECD, 2002) that pertain to specific mechanisms within a causal chain to ascertain change and progress towards achieving a desired result.

Some arenas in which theory-based approaches have been incorporated into monitoring frameworks include, firstly, adaptive 'co-management' programmes, which aim to align environmental systems programmes with positive social outcomes (Carlsson & Berkes, 2005; Hermans, Naber, & Enserink, 2012; Plummer et al., 2012). The indicators for measuring successful outcomes at this nexus have progressed in their utility and effectiveness (Chambers & Conway, 1991; Plummer & Armitage, 2007), yet the tools and procedures for monitoring the *processes* involved in achieving desired outcomes remain inadequate (Chapman, 2014; Cundill & Rodela, 2012). In response, Chapman (2014) presents a framework to guide monitoring and evaluation for collaborative environmental programmes with anticipated social benefits. The framework is unique for collaborative environment programmes in that it adopts a theory-based approach by using the causal pathways from ecosystem service models while incorporating social outcome variables from adaptive co-management theory (Chapman, 2014: p. 47–50).

A second example, and more specifically in the social and policy arena, Hermans, Naber and Enserink (2012) respond to the challenges of designing monitoring and evaluation frameworks that can support adaptive and evidence-based policy processes involving multiple actors in a long-term policy implementation context. They identify two gaps they see in existing approaches to monitoring long-term policies in complex multi-actor systems: one shared policy theory is not always possible or appropriate when multiple actors are involved; and the dynamic process aspects of long-term monitoring are often omitted from monitoring frameworks. Their solution is a highly participatory activity-based approach for developing a long-term framework that aims to synthesise the policy theories of multiple actors while extracting relevant elements to monitor (Hermans et al., 2012).

Programme performance monitoring provides a further arena in which theory-based approaches have been incorporated into programme monitoring. For example, the Impact Monitoring and Evaluation Process (2012, Guerra-Lopez, 2008) is based on a systems approach to improving organisational performance. The framework is premised on the point that system-based processes are more effective than linear causal models (Dyehouse, Bennet, Harbor, Childress, & Dark, 2009) and set alongside a system-based understanding of impact that refers to results from an organisation (intervention) that benefit a wider environment (Kaufman, 2006). The framework is highly process-oriented and iterative, intending to encourage continual improvement for an organisation. One example of its application is found in facilitating performance assessments for civil society organisations (Guerra-Lopez & Hicks, 2015). The example demonstrates processes for developing monitoring indicators through emergent processes (rather than ex ante) based on how participants believed their organisations really worked and what results they were really after (Guerra-Lopez & Hicks, 2015: p. 29) – a form of programme theory – rather than through prescriptive and predetermined performance indicators.

A further example of how theory-based approaches are used to monitor programme performance can be found in the Program Theory Matrix Approach (Funnell, 2000). One challenge to developing a rigorous and appropriate monitoring system is determining which aspects of a causal mechanism to monitor (Weiss, 2000). This approach aims to address this challenge by using programme theory to develop a sequenced hierarchy of intended outcomes (Funnell, 2000: p. 92–96) which then form the basis for developing performance indicators to monitoring progress towards these outcomes.

These examples provide instances in which programme theories have been incorporated into monitoring frameworks. The consistent thread in how these frameworks develop is their participatory nature that incorporates emergence and nonlinearity in determining outcomes and causal processes. The frameworks also hinge on key mechanisms in the causal chains about how a programme should work and what its intended outcomes are if its causal mechanisms hold true, thereby being explicit about specific aspects of programme theories being monitored.

4. Application of theory-based approaches to ACT's monitoring system

ACT's complexity characteristics described above challenge conventional programme monitoring approaches that tend to assume linear pathways of change between inputs and outcomes while holding a fair degree of confidence that the expected results will be realised (Patton, 2011). ACT's monitoring system needed an alternative approach that was sensitive to the systemic complexities of its objectives and its delivery environment, such that an experimental design would not be suitable for. A theory-based approach to its monitoring system offered a means for it to account for these complexities in large part due to its methodological flexibility that could adapt to the programme's variations.

Given the programme's wide-reaching implementation environment and the associated challenges with conducting an impact evaluation, the monitoring system needed to be designed in a way that would enable evaluative learning while rigorously reflecting its results. Once again, a theory-based approach offered a structural solution to designing the results framework and monitoring system according to the specific causal mechanisms in its theory, allowing the programme to build an evidence base through its routine reporting that reflected the causal pathways in its theory of change. This approach would enable process tracing methods for evaluatively assessing the programme's ongoing progress and reflect its results. Starting with the programme's theory of change (ToC), a number of components that were developed to respond to these complexity challenges are outlined below.

4.1. Theory of change

ACT's ToCs identifies climate change as an underlying problem that leads to the loss of lives and livelihoods, and fundamentally affects the drivers of growth in South Asia. This is due to economic and social systems inadequately adapting to climate change. These systems include government mechanisms and procedures, regulations and their enforcement, and economic incentives to invest into climate change resilience, all of which have been ill-equipped for climate change adaptation and have thus been inadequate in safeguarding growth and development.

The ToC identifies a range of challenges that contribute to the ineffective safeguarding of growth and development. These include a lack of skills, tools, knowledge, resources, political support, and coordination on climate change, as well as competing priorities. Provided that these challenges are identified correctly, and that there is demand for

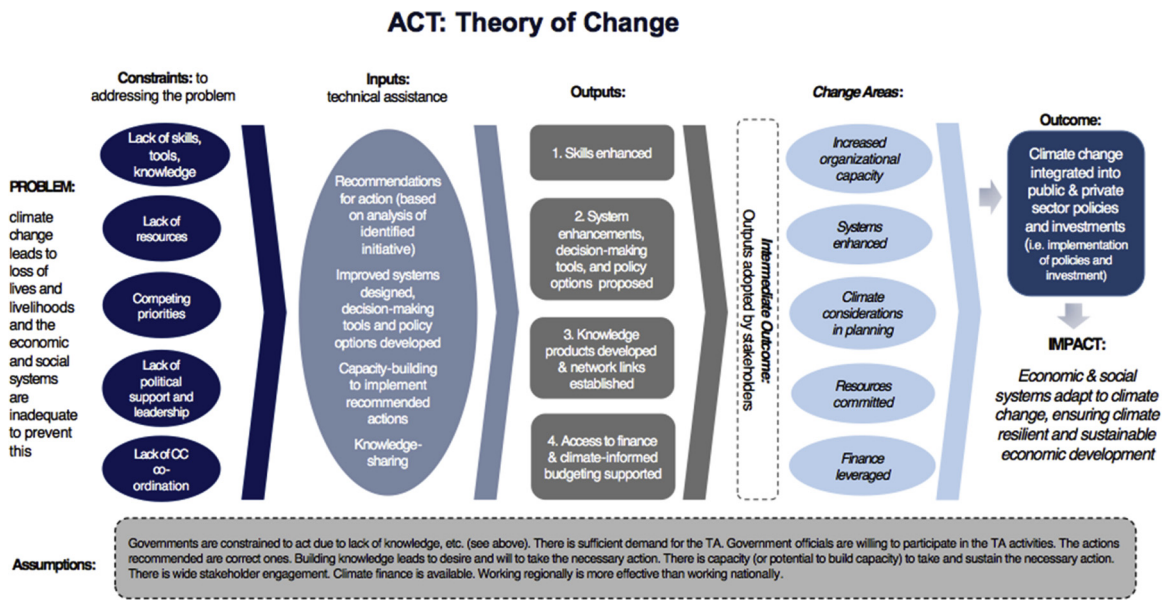
ACT: Theory of Change
Constraints: to addressing the problem
Inputs: technical assistance
Outputs:
Change Areas:
Outcome:
PROBLEM:
climate change leads to loss of lives and livelihoods and the economic and social systems are inadequate to prevent this
Lack of skills, tools, knowledge
Lack of resources
Competing priorities
Lack of political support and leadership
Lack of CC co-ordination
Recommendations for action (based on analysis of identified initiative)
Improved systems designed, decision-making tools and policy options developed
Capacity-building to implement recommended actions
Knowledge-sharing
1. Skills enhanced
2. System enhancements, decision-making tools, and policy options proposed
3. Knowledge products developed & network links established
4. Access to finance & climate-informed budgeting supported
Intermediate Outcome: Outputs adopted by stakeholders
Increased organizational capacity
Systems enhanced
Climate considerations in planning
Resources committed
Finance leveraged
Climate change integrated into public & private sector policies and investments (i.e. implementation of policies and investment)
IMPACT:
Economic & social systems adapt to climate change, ensuring climate resilient and sustainable economic development
Assumptions:
Governments are constrained to act due to lack of knowledge, etc. (see above). There is sufficient demand for the TA. Government officials are willing to participate in the TA activities. The actions recommended are correct ones. Building knowledge leads to desire and will to take the necessary action. There is capacity (or potential to build capacity) to take and sustain the necessary action. There is wide stakeholder engagement. Climate finance is available. Working regionally is more effective than working nationally.

Fig. 2. ACT's Theory of Change.

technical assistance and capacity to absorb it, then technical assistance is seen to provide an effective means to address these problems through systemic change in the governance of climate change for specific communities.

The expected results of ACT's support are that resources are committed by local, state, and national government agencies to reduce the effects of climate change through improved policies being *adopted* and *implemented*, climate funds being *accessed* and *invested*, systems and tools being *improved*, and capacity being *built* – all contributing to improved resilience to the adverse effects of climate change. This theory is depicted graphically in Fig. 2. From the basis of this theory, the programme's monitoring and evaluation system was developed.

4.2. Context assessment

Firstly, the programme emphasised the importance of ensuring strong contextual knowledge through a Context Assessment (CA) implemented in each location, updated on an annual basis. The methodological application of the CA utilises a highly consultative but light-touch approach that allows its replicability each year in each location while ensuring that key stakeholders are included and that data meet quality rigour standards (Gogoi, 2017). The CA provides a snap-shot of the political economy of climate change adaptation in each location, assessing six specific indicators identified for their relevance to the programme (Gogoi, 2017).

4.3. Evaluative indicators

The programme's monitoring system incorporates its context monitoring by translating the CA indicators into *evaluative indicators* (Table 1) as a component of its results framework, which allow the programme to systematically monitor contextual changes that may have important implications for the programme, enabling the programme to adapt to evolving contextual dynamics and ensuring its sensitivity to these dynamics (Whitesell, Sarche, Keane, Mousseau, & Kaufman, 2018). The evaluative indicators allow the programme to monitor key contextual indicators in order to regularly and critically engage with these elements (Buckley, Archibald, Hargraves, & Trochim, 2015; House, 1977) that form the basis of an understanding of the context, which in turn form the basis of key assumptions in the theory of change.

This mechanism – the evaluative indicators based on the Context Assessment – provides a frequent and systematically updated evidence base for these assumptions to evolve, providing a basis from which the programme itself may be adapted as necessary. This understanding of the context allows for the programme team to critically reflect on its assumptions about the context and its understanding of how change will happen and the way the theory of change articulates this (Archibald, Sharrock, Buckley, & Cook, 2016).

4.4. Locally-led planning

Secondly, the programme's response to problems in each location is highly consultative and coevolutionary. As introduced above, the identification of specific inputs was based on an initial 'long-range planning exercise' (LRPE) developed and implemented at the outset of the programme. The LRPE was a consultative process conducted at each location amongst various stakeholders and agents engaged in climate change adaptation brought together to discuss key climate change challenges encountered at each location, in which technical inputs might be usefully employed to enhance adaptation.

After the baseline LRPE process was completed and implementation

Table 1
Evaluative indicators.

Evaluative area	The programme systematically assesses its context of implementation and the pathways of change needed to reach its intended outcomes and achieve its desired impact
Indicators	1. Awareness and understanding of key stakeholders on the risk of climate change for growth and development 2. Availability and use of accurate and relevant information on climate change 3. High-level political commitment to tackling climate change 4. Status of climate change policy framework 5. Effectiveness of coordination and leadership for climate change 6. Effectiveness of the planning & budgeting process for climate change

was underway, processes for determining locally identified problems and solutions were then rolled out on an on-going basis in each location through technically strong and politically engaged team leaders who underwent continual dialogue with local stakeholders to identify new opportunities for the programme to engage in and offer support to specific challenges and solutions (Andrews et al., 2015; Booth, 2014). Also, by ensuring the team leaders are highly engaged with the local climate change governance architecture in each location, the programme has sought to mitigate the emergent aspect of the political environment in which the programme operates (Booth & Unsworth, 2014).

To practically manage this variability amongst locations and activities, an *integration mechanism* was incorporated into the early workstream planning, whereby each of the ten team leaders developed results chains that linked specific workstreams and activities with programme-level outputs. This process helped to bridge the gap between being locally responsive while being programmatically relevant and strategic.

4.5. Categorical indicators

As much as the programme's inputs were deliberately designed to be determined through a consultative and flexible process within the parameters of technical assistance in targeted sectors, so too its output areas required a similar degree of flexibility to account for this variation, allowing the programme to flex to the contextual and organisational needs in which it worked (Shakya et al., 2018). *Categorical indicators* were developed to do this.

Categories were designed to describe and capture the types of outputs that the programme supported, rather than the specific details of each output itself. In this way outputs reflect various baskets of products or deliverables developed within the programme's control that are classified according to the most appropriate category. Moreover, in the context of complex and challenging implementation environments, the flexibility afforded by indicator categories allows for the operational space needed for the adaptive nature of the programme while still reflecting its results.

For example, 'people trained' (output 1.1) may include people trained on climate resilient agriculture in Bangladesh as well as on the development and use of hydrology models in Odisha, while a 'system enhancement' (output 2.1) may include an institutional design and rules of business for the National Climate Change Authority in Pakistan as well as a concept note for integrating climate change actions into the City Disaster Management Plan for the Bombay Municipality Corporation in Maharashtra.

Table 2 reflects the programme's full set of outputs and indicators.

However, when considering the potential use of categorial indicators, a number of important considerations should be taken into account. Firstly, it is important to ensure that outputs represent deliverables or products that the intervention has supported that sit within its direct sphere of control (Bamberger et al., 2012), as this is the anchor point from which the longer process of change – expressed as a 'programme mechanism' (Pawson, 2001) – are traced. In this way the programme's *theory* plays an important aspect in determining the appropriate categories to monitor, with the outputs needing to reflect the primary and most substantive aspects of the support provided by the programme to its intermediaries. Moreover, there is an important conceptual step between the generation of an output and attaching it to a specific output category that aligns with the wider programme (described above as an *integration mechanism* developed for ACT). The nature of this approach to results management differed from many of the team leaders' previous programme experience and required well-supported processes from the central M&E management team to ensure consistency in the way that outputs were categorised and reported.

Secondly, the use of the categorical approach risks losing some of the details about how the programme supports each output in its

Table 2
Outputs & indicators.

Outputs	1. Skills enhanced	2. System enhancements, decision-making tools, and policy options proposed	3. Knowledge products developed and network links established	4. Access to finance and climate-informed budgeting supported
Indicators	1.1 People trained	2.1 System enhancements developed	3.1 Knowledge products developed	4.1 Budgeting tools and approaches to integrate climate change in national and sub-national budgets developed
	1.2 Stakeholders trained on accessing funding for climate-related activities	2. Decision-making tools and policy options developed	3.2 Peer-to-peer learning, sharing or networking events held	4.2 Funding applications developed
	1.3 Person days of training			
	1.4 Useful training			

somewhat reductionist reflection of output results in numeric form. Again, for ACT, this approach was taken in order to prioritise results at a programme level amidst its complex dynamics rather than narrowly reflecting individual location-based results. In order to account for this difference in the programme's monitoring system, increased narrative reporting was emphasised when output results were reported as a way of documenting the qualitative aspects of each achievement. The narrative reporting often placed increased burden on the location team leaders to adequately capture the seemingly ancillary aspects of output achievements yet was critical for providing the actual meaning for each result. Whether such narrative reporting introduced additional burden than may be expected in more traditional programme reporting is not clear.

4.6. Intermediate outcomes = adoption

An intermediate outcome was incorporated into the results framework to indicate the first step outside the programme's direct sphere of control (its outputs) to where its reliance on influence to achieve its intended results takes effect. The wording in ACT's monitoring system for this is the *adoption* of the outputs by stakeholders or beneficiaries. The specific nature of adoption varies by output type and intervention, but the idea is that the outputs supported by the programme are taken up by the intended beneficiaries and endorsed, accepted or otherwise appropriated as their own to be used, resourced, and implemented for their own purposes and ends (Barnett & Gregorowski, 2013; Jones, 2011).

For example, following ACT's advocacy for the development of the bamboo sector based on an enterprise model, the Department of Environment and Forestry in Bihar made a *provision in the Agriculture Road Map 2017-22* to implement large-scale bamboo plantations in the state to ensure the availability of raw material in support of local bamboo enterprise development. This is a result of increased awareness of the government on the issue, in which ACT has contributed by presenting the proposal and advocating for this change to the concerned department, but also by including them into the workshop held for the development of the bamboo sector (ACT, 2018). In this way, ACT's outputs (bamboo plantation proposal and advocacy) were noted as an intermediate outcome result when these were *adopted* as a provision in the Agriculture Road Map (Table 3).

Output adoption forms a critical mechanism in the programme theory's causal chain. The programme's results largely hinge on the intermediate outcome level. This is the first sphere of influence outside the programme's direct control, reflecting the causal pathway for a set of technical assistance activities that lead to outputs, which are then adopted or taken-up in response (intermediate outcomes), followed by a systemic response (implementation and outcomes). As such, it forms a key aspect of its theory-based approach to monitoring, given the centrality of its adoption in its theory of how its support to specific policy changes are understood to progress towards wider systemic change.

The intermediate outcome – as a structural indication of adoption of the programme's outputs – is also a de facto indicator of interim success in influencing intermediaries, reflected by their adoption of the programme's outputs. By monitoring this first stage outside the programme's direct control, this provides a useful indication of the programme's influence towards achieving a particular outcome and reflects its causal process (Jones, 2011). Moreover, reflecting this causal process in a results framework ensures that the component elements of the change process are monitored, laying a foundation for inferring the programme's impact (Weiss, 1997).

Table 3
Intermediate Outcomes & indicators.

Intermediate Outcome Indicators	Outputs adopted by relevant stakeholders 1. Increased capacity of relevant organisations 2. System enhancements adopted 3. Policy options and decision-making tools adopted 4. Budgeting tools adopted 5. Total climate change funding accessed or shaped

4.7. Outcomes = implementation

ACT's outcome, according to its original design, is that 'climate change is integrated into public and private sector policies and investments'. Keeping this specific verbiage, we added a further clarifying dimension that *we understand this to mean that the programme's outputs are implemented*. These two concepts align insofar as the programme-supported technical outputs are adopted by stakeholders, and their use, reflecting capacity, resourcing, and authorisation (Andrews et al., 2010), reflects their integration into public and private sector policies and investments (Table 4).

In this way, the outcome verbiage reflects the systemic change that the programme set out to achieve – integrating climate change sensitive policies into mainstream governance systems – but is able to be monitored through the programme's theory, determined by assessing the degree to which adopted policies are implemented. Moreover, policy implementation is not incorporated into the results framework simply as an *assumption* that adopted outputs will be implemented; rather, they are rigorously monitored and assessed as a part of the programme's key monitoring activities, with rigorous verification and evidence requirements to ensure that implementation is effectively occurring – through various criteria such as adequate resourcing and capacity – before outcomes are reported as being achieved.

Adoption and implementation are crucial mechanistic points in a policy intervention's causal pathway. However, there are significant developments that occur along this process that are not necessarily captured by these two points. A monitoring system needs to be able to capture the additional narratives if an understanding of the process is to be developed, rather than just these milestones that themselves might indicate effectiveness while failing to capture the wider story of how and why they were achieved.

4.8. Impact = effects of implementation

The culmination of the programme's effects occurs in its impact, determined as the results of effectively implemented programme outputs. ACT's impact is articulated as 'the economic and social systems of South Asia are adapted to climate change, ensuring climate resilient and sustained economic development'. Three indicators are used to measure this: the first provides a fairly broad sweeping way to capture communities that fall with the remits of policy changes that the programme has supported; the second is largely inferable from the preceding logframe levels (the outcome in particular) while the third requires a more specific methodology to determine and verify (Table 5).

A challenge for presenting impact this way – that is, as the *effects of implemented outputs* – is the difficulty in knowing the *actual* impacts of policies when implemented effectively (Hermans et al., 2012). For a policy intervention such as ACT, effective policy implementation is influenced by many aspects, actors and processes that lay outside of the intervention's control (Hermans et al., 2012). This reality is also a reason that the evaluative indicators were introduced for ACT as a means of mitigating this uncertainty by systematically and rigorously monitoring contextual factors that were seen to be critical change areas that ACT both sought to influence and anticipated being influenced by.

Thus, while the final step towards inferring the programme's impact is laden with uncertainty, the logic of theory-based attribution (see Section 3.1) provides a means for getting to the point at which impact should occur; evaluating whether it does is separate from what this monitoring framework is able to provide for. This framework is not designed to monitor the ongoing impacts of policy implementation (a challenge raised in Section 3.2 by Hermans et al. [2012]), but rather

Table 4
Outcomes & indicators.

Outcome	Climate change integrated into public and private sector policies and investments
Indicators	1. System enhancements, policy options and budgeting tools implemented
	2. Investments made

monitoring the processes and causal mechanisms for getting to the point of effective implementation, wherein the systemic change goals of the programme were seen to be largely realised.

5. Lessons learned

Using the programme's theory as its base, ACT sought to develop a monitoring system that could account for the delivery environment and programmatic complexities it embraced in its design while ensuring effective results monitoring. The design features in ACT's monitoring system that attempt to reconcile these complexities are described below, along with some of the lessons learned for each. Caution should be used in the holistic application of ACT's model in other contexts or programmes, based on the nature of the programme's design and whether the causal mechanism is consistent with those utilised within ACT's model. The contextual dynamics, substance of policy change supported, and the resourcing allocated to monitoring and reporting on the programme's effectiveness are further aspects to consider.

5.1. Designing for complexity

Firstly, the non-linear nature of ACT's causal pathways, due to the high levels of political influence and climate change variabilities and impacts is mitigated through continual engagement by the programme team in political and technical dialogues with relevant stakeholders and actors in each location to assist in the uptake (adoption) and utilisation (implementation) of its outputs – core causal mechanisms in the programme's theory – as much as possible. This approach recognises the significant role that influence plays in this process – not just the delivery of outputs – towards systemic policy change.

The structure of the results framework and use of categorical indicators allow for the programme to manage a high degree of uncertainty both in the way that its outputs are determined and tailored to respond to specific needs, as well as the broader uncertainty of what success looks like for the programme in each location – a frequent challenge amongst donor preferences for pre-planned project models (Shakya et al., 2018; Tyrrel & Cole, 2016).

An implementation challenge of this can be that team leaders or programme managers can occasionally struggle with appropriately categorising outputs, where they may straddle distinctions between the indicators. To resolve this, a part of ACT's results management processes includes a quality control mechanism to assess each claimed result (outputs, intermediate outcomes, and outcomes) to ensure that they meet technical quality standards and are adequately complete according to their specific definition before being reported as a claimed result. This helps to not only ensure that technical quality standards are maintained, but also that results are classified consistently and appropriately within programme objectives.

By building the theory of change process into the results framework – following the influencing sphere logic and the adoption and implementation process – it allows the programme to monitor its own causal processes to account for varied outcomes across the enormously varied activities and locations; categorical indicators, particularly at the output level, provide operational flexibility for the programme to be highly responsive at location levels to local needs and solutions. However, this comes at the cost of greater output-specific details forming the substance of the output indicators.

5.2. Utilisation

The implementation challenge of the programme's 'categorical indicators' is that output adoption and implementation is determined uniquely, and on a case-by-case basis: as much as each output and its policy context is different, so too is its adoption and implementation. The qualitative quality control mechanisms that underpin results reporting and approval is again vital to ensure that the programme theory is adequately understood and consistently applied across the programme's results and that its achievements are rigorously assessed for veracity, which is often a subjective process, rather than the simple application of a rule or standard of completion. The emphasis on results verification is critical for ensuring consistent standards are met for claimed results, with evidence consistently held to substantiate claimed results.

Moreover, there are technical quality components that are important premises of the programme's outputs that need to be determined as foundational to the subsequent causal processes of its achieving results. These technical dimensions, because of their variation and depth, require specific sectoral capacity to adequately assess their veracity. While the programme has embedded quality checks into its internal results verification system, external validation would be required to assess outputs' technical veracity in the context of any evaluative judgements made on the programme.

The qualitative and narrative reporting that accompanies results achievements should also be emphasised. Whilst this approach describes a theory-based framing for a complex programme, supporting narrative around the processes and activities that the programme provides adds considerable and much-needed value to reporting on how results are achieved, and why. This is a common component of routine programme monitoring and should not be omitted in this context.

5.3. Monitoring versus evaluation

The programme's objective to support systemic policy change, encompassing much of the elements of complexity described above, is perhaps most clearly enabled in its explicit theory that identifies its spheres of influence, the processes that unfold through output provision, adoption and implementation, and the inferred outcome- and impact-level results through observing success in these causal processes. And in this way, the theory-based approach to monitoring the programme's results also has evaluative benefits particularly salient to challenging environments in which attribution is difficult to determine, or where the programme's remit makes comprehensive evaluation

Table 5
Impact & indicators.

Impact	Economic and social systems adopt to climate change, ensuring climate resilient and sustainable development
Indicators	1. Number of people reached by climate policies, whose vulnerability to climate change has been reduced
	2. Governance systems adapted for climate change
	3. Reduced costs of climate change impacts

methodologies prohibitive and resource-intensive. This is because the outcomes and impact are measured at specific mechanisms (adoption and adaptation) along the causal pathways through the programme's spheres of influence, rather than basing the measurement of impact on observable differences in the programme's implementation environment. However, as noted in section 4.8, the actual impacts of policy implementation are highly variable and contingent on many factors, and direct causal inference should be cautiously caveated by these factors.

Further, as much as this paper has provided an example of a theory-based approach to developing a monitoring system for a complex policy initiative, this approach should not be seen as a panacea to solving all causality questions that an intervention or its evaluation might have (Mayne, 2011). It is worth reiterating that this paper has developed a *monitoring* framework for a policy initiative, not an *evaluation* design. As such, there are elements within the results framework that would require more extensive validation and verification, such as the actual delivery of adopted outputs in their effective implementation in order to establish the degree of impact that the programme may *actually* have.

Moreover, the claims in this paper about the utility of a theory-based monitoring system also in no way suggest that such a system can replace or substitute an externally designed and implemented evaluation as the preferred means of establishing the programme's worth and effect. It can, however, be helpful in providing a basis from which to viably infer impact and reduce uncertainty about the contribution being made by the programme while providing ongoing evaluative monitoring to feed into programme decisions about adaptation and implementation. But inferential causality should still remain distinct from evaluatively-determined impact.

6. Conclusion

Complex implementation environments, and reciprocal programme design complexities, present challenges to the way that programmes monitor and evaluate their effectiveness. ACT developed a theory-based monitoring system as a means of managing the contextual and programmatic complexity that it operates in. The result has been a flexible framework that has allowed the programme team to implement a highly diverse portfolio of support while still reflecting the processes – albeit often nonlinear and emergent – of change that the programme has contributed to and the results it has been able to achieve.

A theory-based approach can provide greater flexibility in the structure of a monitoring framework that also enables a programme to overcome many of the challenges presented by implementation and design complexities. The flexible facets that this paper discusses include categorical indicators that capture diverse inputs and outputs, an intermediate outcome level that accounts for an underlying theory of influencing causality through an adoption logic, while serving as an important mechanism in the programme's causal process. Furthermore, its outcome level monitors effective implementation of programme outputs by stakeholders as a further causal mechanism to indicate systemic change without requiring onerous methodologies.

The objective across an entire monitoring system such as this is ultimately to reduce the uncertainty around a programme's contribution to its objectives while providing a basis for it to adapt to complex and emergent policy environments in its efforts to influence lasting and systemic change. A theory-based approach to monitoring can offer a means of doing this by identifying key causal mechanisms from its programme theory to form the structure for a monitoring framework. While this paper has sought to provide practical examples of a theory-based monitoring system and its component tools, its applicability in other programmatic contexts should be carefully considered against the programme theory and implementation dynamics in determining its appropriateness.

Funding statement

This research did not receive any specific grant from funding agencies in the public, commercial or not-for-profit sectors.

Acknowledgements

The author is grateful for the inputs provided by Cristina Rumbaitis Del Rio (ACT's Regional Programme Manager), Claire Simon, Kandi Shejavali and Marcela Tarazona; and to Stephen Jones and Nils Riemenschneider, who engaged substantively in the initial design of the ACT M&E system.

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Jesse McConnell is an independent consultant in international development. He specialises in developing monitoring, evaluation and learning systems for complex programmes in challenging environments. He is particularly interested in programme adaptation in emergent conditions, such as conflict-affected environments or programmes predicated by high levels of political change. He has professional working experience throughout Africa, South and Central Asia, and the Middle East.